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AMMO FOR THE LONG HAUL:

THE SUFFICIENCY OF POLICY FOR MUNITIONS RESUPPLY WITHIN THE EXPEDITIONARY AIR FORCE CONSTRUCT

by

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The employment of the Expeditionary Air Force (EAF) concept requires that AF munitions resupply policy adequately address expeditionary operations. The question that this research set out to answer is whether or not this policy exists-that is to say, is the current AF policy for munitions resupply sufficient in light of the EAF concept? The primary conclusion of the research is that the move to the EAF concept has not significantly altered the processes associated with munitions resupply. As such, no significant modifications to existing guidance specifically in support of this concept are necessary. However, adoption of the EAF concept, combined with the stresses put on the AF munitions community by years of increasing operations tempo, has exposed pre-existing deficiencies in munitions resupply guidance. Specifically, this guidance is sufficient at the tactical level but is inadequate at the operational or strategic level. This paper concludes by making multiple recommendations, including the creation of an Air Force doctrine document specific to Munitions Combat Support and establishment of a course on contingency munitions management to be taught at the Air Force Combat Ammunition Center (AFCOMAC) are offered.

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Preface

My fourteen years of working in and around the Air Force "AMMO" community has indelibly etched upon my mind the dedication of the men and women who perform their mission with pride and determination. This research paper is my pale attempt to add to the body of work that chronicles this devotion. Specifically, I've been impressed with the work that munitions professionals do to ensure that the right munitions, in the right quantities, are available at the right time, in the right location to accomplish a wide variety of missions. My impression has been that this was often done despite having inadequate guidance to perform this task. This paper is my attempt to verify this hunch, and make an effort in improving the status quo where necessary. In this effort I'm indebted to many individuals. I'm grateful for my Faculty Research Advisor, Lt Col Bob Moriarty, for his patience and willingness to endure to the end along with me. I'd also like to acknowledge the AMMO professionals who provided insights gained from moving munitions over the last 30 plus years…Mr. Dan Fri, Mr. Mike Gavin, Mr. Greg Osbun, and the ultimate AMMO troop CMSgt John Hough. To all IYAAYAS! I'd also like to acknowledge Lt Col Mike Moore for his direction in this project. Finally to my wonderful wife Susan, thanks for sacrificing some of our time to allow me to scratch this itch. It's the latest in a long series of sacrifices you have made over the last 14 years and I will never be able to thank you enough.

Abstract

The employment of the Expeditionary Air Force (EAF) concept requires that AF munitions resupply policy adequately address expeditionary operations. The question that this research set out to answer is whether or not this policy exists—that is to say, is the current AF policy for munitions resupply sufficient in light of the EAF concept? The primary conclusion of the research is that the move to the EAF concept has not significantly altered the processes associated with munitions resupply. As such, no significant modifications to existing guidance ***specifically in support of this concept*** are necessary. However, adoption of the EAF concept, combined with the stresses put on the AF munitions community by years of increasing operations tempo, has exposed pre-existing deficiencies in munitions resupply guidance. Specifically, this guidance is sufficient at the tactical level but is inadequate at the operational or strategic level. This paper concludes by making multiple recommendations, including the creation of an Air Force doctrine document specific to Munitions Combat Support and establishment of a course on contingency munitions management to be taught at the Air Force Combat Ammunition Center (AFCOMAC) are offered.

Part 1

Framing the Problem: Munitions Resupply Guidance Issues

Providing the enemy the opportunity to die for his country!

—AMMO Coin

As we explore the earliest years of an unfolding century, friend and foe alike acknowledge America's preeminence as the world's sole superpower. America's desire to maintain this role through, among other means, the use of military strength is evident in the September 2002 US National Security Strategy. It states in part "Our forces will be strong enough to dissuade potential adversaries from pursuing a military build-up in hopes of surpassing, or equaling, the power of the United States."[1] While there are multiple means by which this military force can be applied, increasingly airpower has been the weapon of first, and sometimes only resort. In a series of conflicts from Operations Desert Storm, where the preparatory use of airpower is credited for significant reductions in friendly casualties during the ground campaign, to Operation Allied Force, which some have described as a victory through the air[2], the use of airpower has become not merely ***a*** tool, but ***the*** tool of choice for demonstrations of American military will. As with most trends in the history of war, this shift toward the preeminence of airpower is not monocausal. Many factors, including advances in aircraft design and increased political concerns about collateral damage have played a role. The relative importance of these and other factors continue to be debated by military historians.

What cannot be debated, however, is that the new preeminence of airpower would not be possible without munitions. From a support sense, nearly every aircraft the Air Force (AF) deploys has some connection to munitions; from engine starter cartridges for KC-135 tankers to the T-38 trainer's ejection seat components. When offensive force is desired, munitions supply the "power" in airpower. They offer leaders at all levels the ability to create any of a number of effects upon the adversary while minimizing impact on non-combatants. The effect of munitions development, particularly "smart" weaponry on US military tactics is clear. During Operation Desert Storm, 10 percent of expended munitions were guided in some way, while roughly 10 years later, in Operation Enduring Freedom (OEF), that number had increased to 92%.[3] Surely munitions support is key to the effective use of airpower today and in the foreseeable future.

If it's understood that munitions are essential for the AF to meet its wartime requirements, ensuring that the proper munitions components are available in sufficient quantities, at the right time and location, is a key airpower enabler. While it is key, it is not easy to accomplish. Behind simple phrases like "the proper munitions" or "available at the right location," are a myriad of processes that must come together to make this happen. Moreover, these processes, taken collectively or individually, are influenced by a complex weave of circumstances. Even a simple scenario such as a show of US will involving a single B-2 bomber flying from home station to drop eight joint direct attack munitions (JDAM) half-way around the world requires significant munitions planning and logistical support. Using multiple types of aircraft flying out of several, dispersed bases in support of operations like OEF significantly complicates munitions planning and support. For these munitions related processes to be as efficient and effective as possible, they must be bounded by a set of rules that ensure the goals of the system are obtained. In the military these rules are collectively known as "guidance" or "policy."[4] Fortunately, given

the criticality of munitions to the AF, some guidance has historically existed to direct the execution of processes to resupply AF munitions. However, the recently adopted Expeditionary Air Force (EAF) concept has brought the adequacy of the existing guidance into question.

Into the future…the Expeditionary Air Force Concept

In response to force structure challenges, the AF implemented the EAF concept in 1998. At the time of its introduction, F. Whitten Peters, acting Secretary of the Air Force noted: "During the Cold War, the Air Force was a garrison force focused on containment and operating…out of fixed bases….Over the last decade, we have closed many of those fixed bases and our operations have been increasingly focused on contingency operations in which selected squadrons deploy from these locations to forward bare bases for the duration of the mission."[5]

The codification of the EAF is evident in the AF Vision 2020 document, which notes "we are an expeditionary aerospace force configured for the full spectrum of aerospace operations."[6] Gen Jumper, current CSAF has stated that the EAF is the "Core of our deployable combat capability" and "the way that the AF will present forces to combatant commanders from this point forward."[7] This transition from fighting in garrison to primarily fighting at deployed locations has profound implications across the AF, particularly in mission critical complex processes like munitions resupply.

Logistical guidance for commodities to support the EAF construct has been slow to develop. In 1999, Lee proposed prepositioning as a prime logistics concept for the AEF. [8] While this recommendation might have merit for aircraft equipment, it does little to add to the commodity debate as prepositioned munitions predate the AEF concept. *Aerospace Expeditionary Force Planning*, AFI 10-400, the most recent guidance on AEF planning, contains only one paragraph with any reference to logistics. That paragraph refers primarily to the Agile Combat Support

(ACS) concept as the key to producing combat support capabilities critical to decisive aerospace power."[9] The same paragraph goes on to note that the ACS does NOT include munitions. AMMO Vision 2010 "United States Air Force Agile Combat Support for Munitions," has three primary objectives to support the AEF; developing a lighter STAMP, developing a viable bare-base munitions support strategy, and developing leaner, lighter, munitions support equipment.[10]

The EAF construct does mean that it is now more likely that munitions will be stored away from the locations at which they will be needed. Thus, munitions resupply actions taken to support units deployed in the EAF concept becomes more complicated. What actions or processes fall under the resupply umbrella? While there is no all-encompassing list, there is some guidance in Joint Publication 1-02 *Department of Defense Dictionary of Military and Associated Terms,* which defines resupply as "the act of replenishing stocks in order to maintain required levels of supply."[11] From that definition, it can be inferred that the act of replenishing ***munitions*** stocks involves processes to do the following; managing munitions stockpiles, transporting munitions stocks, handling munitions, receiving/integrating munitions into existing stocks at the desired location, and maintaining accountability over the munitions during the entire resupply process.

Since the earliest days of the Army Air Corps, there has been a need for munitions resupply. The substantive difference with EAF implementation is the number of places to which munitions will need to be transported and the speed at which they will be needed. Given these complicating factors, EAF munitions resupply cannot be done in a piecemeal fashion. It is simply imperative that guidance and procedures for munitions resupply are set in place. Having these procedures reduces time dedicated to planning during a crisis and maximizes time available for plan execution. One researcher noted:

> "To implement the EAF concept, several difficult requirements must be met. First, the Air Force must be able to respond and sustain operations at austere or even bare base locations around the world within the first few days of a crisis or conflict. Next, the limited nature of available airlift to support deployment operations requires that any AEF remain as light and lean as possible. Third, the commander of the combatant command expects Air Force elements to provide the capability to conduct precision attacks and to be able to sustain them for indefinite period of time. To meet these rigid requirements, the Air Force must overcome the problem of transporting and providing thousands of short tons of munitions needed to support a combat AEF."[12]

Simply put, when a crisis hits, the AF cannot afford munitions planning to be a "pick up game." Guidance must be clear and comprehensive to allow for quick actions to support any contingency. The remainder of this paper will be an investigation of available guidance with the goal of determining if it is sufficient for handling munitions resupply operations under an EAF construct.

Research Question

The discussion thus far has revealed the critical importance of munitions resupply guidance in supporting potential AEF employments. In response to this discussion, the following research question was investigated; does current AF policy sufficiently address Expeditionary Air Force munitions movement and resupply operations? If not what modifications are necessary?

The answer to this question hinges to a great degree on how the word "sufficiently" is used in the research question. "Sufficiently" was specifically selected because it contains a balance between two extremes. On one side, guidance can inhibit creativity and innovation when new situations arise. On the other hand, non-existent guidance means every decision is made without regard to the system as a whole. Sufficient guidance provides enough detail to create a predictable process while allowing individuals in new situations enough room to react. For the purposes of this paper, policy will be deemed sufficient if it currently exists in written form, is referred to on a frequent basis, and is the primary basis of decision making during operations

where the EAF construct is employed. This definition purposely allows the possibility that for portions of munitions resupply operations the guidance can be found to be sufficient while in others, insufficient guidance exists.

Methodology

To answer the research question posed above, a two-phase approach was conducted. First, sources of guidance for AF munitions resupply were identified. This "literature review" provided an important starting point in identifying where policy did and did not exist relative to munitions resupply activities. Second, Operation Enduring Freedom was used as a case study to see if the guidance identified in phase one was actually employed during a contingency operation fought under the EAF concept. To this end, interviews were conducted with key munitions leaders who worked resupply issues during this operation.

It is also important to note that concurrent with this project, an Air Force Inspection Agency Eagle Look (EL) investigation (PN 03-501) is being conducted to assess the effectiveness of processes for beddown of non-nuclear munitions and missiles. As part of this EL, inspectors are examining guidance specific to new weapon system beddown. Based on preliminary data, it appears as if this EL will touch on some of the same issues that are examined in this paper. Unfortunately, the official EL report has not yet been released and so its findings are not included in this research effort.

Summary

This chapter established the importance of munitions to the successful application of AF airpower today and for the foreseeable future. Further, it noted that the implementation of the EAF concept by the AF has the potential to effect munitions resupply efforts. Finally, the

chapter concluded by detailing the main thrust of this research effort; an examination of guidance relative to munitions resupply in an EAF environment.

Notes

[1] *The National Security Strategy of the United States of America*, The White House, September 2002, p 30.

[2] Daniel A. Byman and Matthew C. Waxman, "Kosovo and the Great Air Power Debate," International Security, Spring 2000, p 6.

[3] RADM Thomas Zelibor, "Naval Forces in Support of Operation Enduring Freedom," Lecture to Air Command and Staff College, Maxwell AFB, Al, 21 February 2003.

[4] While there are some subtle differences in the common uses of these two words they are identical in purpose. The Merriam-Webster dictionary defines policy as "a definite course or method of action selected from among alternatives and in light of given conditions to guide and determine present and future decisions." Guidance is defined as "the act or process of guiding," with guiding being further defined as "to direct, supervise, or influence usually to a particular end." For the purposes of this paper then both words are used to represent documentation produced with the intent of guiding a particular process or set of processes.

[5] SMSgt Jim Katzaman, "Air Force readies itself for 21st Century", *Air Force News Service*, 6 August 1998. On-Line. Internet, 19 February 2003.

[6] Department of the Air Force, *America's Air Force: Vision 2020*, 2000, p 1.

[7] Gen John P. Jumper, "Capabilities Based CONOPS and the Task Force Construct," Air Command and Staff College Lecture, 9 September 2003.

[8] Maj Joni R. Lee, "Prepositioning: A Logistics Concept for the AEF," (research report, Air Command and Staff College, April 1999), vii.

[9] Air Force Instruction 10-400, *Aerospace Expeditionary Force Planning*, 16 October 2002, 9.

[10] Air Force Instruction 21-201, *Management and Maintenance of Non-Nuclear Munitions*," 1 December 2000, 221.

[11] Joint Publication 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 (As amended through 9 January 2003), p 457.

[12] Lt Col David K. Underwood and Captain John E. Bell, "AEF Munitions Availability," *Air Force Journal of Logistics*, Winter 1999, p 12.

Part II

Guidance

"At the very heart of war lies doctrine. It represents the central beliefs for waging war in order to achieve victory...It is the building material for strategy. It is fundamental to sound judgment."

Gen Curtis E. LeMay

Guidance, or policy, is certainly not unique to the military. Most complex organizations provide guidance in some form so as to preserve the quality of the product they offer or minimize variance in a process. Because of the nature of the military, with its reliance on lethal force, guidance takes on particular importance. Further, because of the diversity of missions the US military is asked to execute, there are typically multiple sources of guidance for any particular operation. A more complete discussion on guidance for military operations is found in appendix A "Types of Guidance" and appendix B "Where Guidance Comes From," to this paper. This chapter will cover guidance specific to munitions resupply actions.

Guidance for Munitions Resupply Operations

"In order to make assured conquests it is necessary always to proceed within the rules: to advance, to establish yourself solidly, advance and establish yourself again, and always prepare to have within reach of your army your resources and your requirements."

Fredrick the Great

Having examined the types and sources of guidance for military processes generally, it's now time to narrow the focus of the research and review guidance specific to munitions resupply operations. To facilitate this examination, this paper categorizes guidance into five groups based on different processes that support these operations. First, the overarching section examines guidance for the overall goals and priorities of munitions resupply related processes. Second, the receipt and integration section identifies guidance on the beddown of munitions at deployed locations. This section includes the planning processes associated with operations at new (and perhaps bare) bases. Third, the transportation section examines guidance specific to the movement of munitions. Fourth, a section of supply policies will discuss guidance specific to munitions accountability. Fifth, the research identifies guidance specific to ammunition handling processes such as safety and storage.

Because of this paper's length limitation, it is impossible to discuss all documents that might have some play on the many activities that come together in the worldwide munitions sustainment process. In response to this limitation, ***representative*** guidance is discussed in the body of the paper. This material is supplemented with a more comprehensive table of documents relating to munitions resupply located at appendix D.

Overarching Munitions Resupply Guidance

There are a series of documents that provide an outline of some of the general concepts of logistics, and in so doing, provide guidance for munitions resupply operations. The DoD and AF primarily issue these documents.

Department of Defense. For the most part, the DoD documents that fall under this category are broad statements of strategic planning or doctrine. They outline the manner in which the DoD is currently organized for warfighting and peacetime operations. Requirements for

logistical support are frequently mentioned in these documents. For example, in Joint Publication (JP) 1-0, *Joint Warfare of the Armed Forces of the United States*, sustainment is described as an enduring enabler, and logistics considerations are "integral elements of military planning for all types of operations from the development of requirements, options, and concepts through the conclusion of operations."[1] JP 3-0, *Doctrine for Joint Operations*, primarily addresses the fundamentals of operating as a joint team and includes some key remarks concerning directive authority for logistics matters in crisis and peacetime.[2] This is critical to munitions planners looking at supporting a Joint Force Commander's request for ammunition not currently allocated to that theater. The bulk of the relevant JCS doctrine for logistics matters is in the JP 4-0 series publications. Specifically, JP 4-0, *Doctrine for Logistics Support of Joint Operations*, is the "keystone document of the logistics support of joint operations series" and "provides doctrine for logistic support of joint and multinational operations."[3] Among the key themes of JP 4-0 is the sharing of responsibility for logistics (and thus supplies such as munitions) between the Combatant Commanders and Service logistic planners. Combatant Commanders are given directive authority for logistics and can exercise approval authority over service logistic programs that will have "significant effects on operational capability or sustainability."[4] During a crisis, the Combatant Commander's authority is enlarged to include the ability to divert resources as necessary to facilitate mission accomplishment.[5] JP 4-0 also contains a complete breakdown of the logistics responsibilities within the DoD[6] and a checklist for logistical considerations for OPLANs and CONPLANs.[7] Contained in this checklist are a series of eight questions pertaining specifically to munitions including "What are the critical munitions required for this operation?" and "Have arrangements been made for the transportation of ammunition within the theater?"[8]

DoD and JCS strategic planning documents also contain overarching guidance that applies to munitions operations. For example, in JV2020, the section on Focused Logistics identifies needed improvements to the Joint Reception, Staging, Onward Movement and Integration (JRSOI) and calls for a better coordinated approach to the issue of theater distribution processes. Both of these critical issues directly impact munitions resupply operations.[9] In addition to JV2020, the annual Defense Planning Guidance, and Joint Strategic Capabilities Plan both contain guidance on SECDEF and CJCS programming priorities that can, and in most years will, speak to munitions related programming.

Air Force. Unlike JCS doctrine, AF doctrine has much less to say about munitions resupply issues. While the use of munitions is a fundamental underlying assumption of the entire AFDD 2-0 series, *Air Warfare*, AFDD 2-4, *Combat Support*, is the primary doctrine document for munitions resupply operations. This document identifies munitions as one of the "major combat support functions" and defines the role of this function as "procure, manage, allocate, and maintain munitions to include maintenance, buildup, staging, delivery and loading."[10] In guidance pertaining to munitions resupply, AFDD 2-4 notes that deployed forces will rely on prepositioned stock and war reserve materials to accomplish their assigned missions. Additionally, these forces will depend on "time definite resupply," defined as "delivering, immediately resupplying, and sustaining a deployed force when and where needed."[11] Prepositioning is a recurring theme in this document because of its ability to reduce airlift requirements; however, planners are cautioned strongly to "maintain a balance between prepositioning and the ability to deploy into areas where there is no staged material."[12]

AF Vision 2020 identifies the need for "Effective, efficient logistics" as a key "to sustaining expeditionary forces."[13] Harnessing the power of "information technology" is clearly identified

as one means to achieve effective, efficient logistics.[14] This doctrinal statement provides support to munitions staffers fighting to gain resources for technologies such as radio frequency (RF) tags and updates to the Combat Ammunition System (CAS) in support of AF Vision 2020.

Overall stockpile munitions management, particularly supporting contingency operations is one area where overarching guidance is lacking. While there are documents that refer to parts of the process, particularly at the tactical or field level, guidance for management at the operational or strategic level is thin. AFPD 21-2, *Non-nuclear and Nuclear Munitions*, the policy document upon which more detailed policy is based, contains little guidance concerning stockpile management. Specifically, this doctrine document states "Consistent with war plans…the Air Force will position munitions in various theaters of operation and on prepositioned ships."[15] No mention is made about the preferred storage method (land or sea), nor is a desired ratio of sea to land munitions offered. Moreover, as this document is dated June 1993, it obviously cannot provide any guidance on munitions stockpile issues in an EAF environment. AFI 21-201, *Management and Maintenance of Non-Nuclear Munitions,* does provide some additional detail on AF stockpile management in assorted sections but still fails to outline the entire process of munitions resupply. In AFI 21-201, 8 pages out of 293 are dedicated to discussing the Global Asset Positioning program. This is the key program designed to integrate munitions war reserve material programs to "provide war fighting Commanders-in-Chief (CINC) with their initial starter stocks" and provide "rapid swing stock response capability with the APF and STAMP/STRAPP, and…swing stock positioning by theaters and CONUS."[16] In the same document, 63 pages are dedicated to developing a munitions base support plan. In other words, nearly eight times more guidance is given on the tactical running of a base level munitions stockpile, than the overall AF stockpile.

Deployed Operations…Receipt, Integration and Beddown

There are multiple sources of DoD and Air Force guidance for establishing operations at new locations and subsequently receiving and integrating the supplies and equipment necessary for sustained operations.

Department of Defense. JP 4-01.8, *Joint Tactics, Techniques and Procedures for Joint Reception, Staging, Onward Movement, and Integration*, is the primary JCS doctrinal reference for deployment of personnel, equipment, and material necessary to meet operational requirements. Unfortunately, munitions specific information is lacking in this document. In JP 4-01.8, a document exceeding 150 pages, the word munitions appears only 7 times. In no instance is any mention made to the unique attributes of munitions shipments or specific requirements relative to their safe and secure handling. This publication does contain a diagram of a newly established operational location with a munitions storage area identified; however, no guidance is offered on any aspect of its creation and long-term sustainment.[17]

Air Force. The AF has produced a comprehensive series of operations instructions that address deployment to, and working out of, a forward operating location (FOL). Almost all of these publications have been recently enhanced to incorporate the EAF concept. For example, AFI 10-400, *Aerospace Expeditionary Force Planning*, provides "policy and guidance to conduct planning for Aerospace Expeditionary Forces" including "describing the roles, responsibilities, and relationships of Air Force Organizations involved with AEF operations."[18] More detailed guidance is found in AFI 10-403, *Deployment Planning and Execution*. In this instruction, the Beddown Capabilities Assessment Tool (BCAT) is introduced as a way to perform mission capability analysis including munitions factors.[19]

Perhaps the two most significant documents providing guidance for munitions deployment and beddown are AFI 10-404, *Base Support and Expeditionary Site Planning*, and AFI 21-201,

Management and Maintenance of Non-Nuclear Munitions. In AFI 10-404, attachment 26 (9 pages in total) is dedicated to the creation of a munitions employment plan (MEP) supporting development of Operational, Concept, and Base Support plans. The comprehensive MEP outline found in AFI 10-404 addresses all processes for deployed munitions operations. Included are procedures ranging from receipt of new munitions and establishment of a munitions storage area to daily deployed operations.[20] AFI 21-201 provides additional detail on the creation of a conventional munitions base support plan including examples to facilitate plan construction.

Transportation

Currently US armed forces operate from a combination of fixed bases and deployed operating locations throughout the world. To support these operations, the DoD created an elaborate transportation network. This network is designed to deliver a constant stream of supplies in peacetime. In wartime, the system provides necessary equipment and supplies to support contingency operations. Owing to the different modes of transportation (air, land, sea) and hazards associated with shipping munitions, there's extensive guidance for transporting munitions items. Specific examples of this guidance from a DoD and AF perspective will be examined below. It's worth noting that guidance for packaging of munitions items also comes from outside the military. The Code of Federal Regulation-Transportation (CFR 49) is a specific example.

Department of Defense. There is a plethora of DoD guidance on transportation matters. For example, JP 4-01, *Joint Doctrine for the Defense Transportation System*, contains a breakdown of the roles, responsibilities and interrelationships of the transportation system. It also provides more detailed guidance on available transportation resources and how these resources are to be employed.[21] The guidance here is particularly important to the movement of

munitions for resupply by air and sea. Additional general transportation guidance comes from JP 4-01.2, *Joint Tactics, Techniques and Procedures for Sealift Support to Joint Operations*, JP 4-01.3, *Joint Tactics, Techniques and Procedures for Movement Control*, and DoD regulation 4500.32R, Volume 1, *Military Standard Transportation and Movement Procedures*, among others. More specific guidance on specific modes of the transportation system is found in instructions like CJCSI 4310.01, *Logistic Planning Guidance for Pre-Positioning Ships*. This document gives detailed instructions on the Service components' responsibilities for maintenance of the cargo and costs associated with the program. It also includes a breakdown of how the prepositioned ships are controlled in peacetime and wartime. The following passage from this instruction illustrates the control issues associated with transportation assets, in this case prepositioning ships:

> For deliberate planning, the JSCP apportions the PREPO ships as forces. During execution, actual commitment of PREPO ships and cargo will be in accordance with CJCS established priorities. During Execution, requests for reallocation of PREPO cargoes will be addressed to the CJCS…Final authority to divert PREPO ships and cargoes from their primary task requires NCA approval….Upon discharge of Pre-positioned cargo and release of the PREPO ships by the supported CINC, the ships will revert to the USTRANSCOM common-user sealift pool unless assigned, by the CJCS, to support the operational requirements of another CINC."[22]

This statement, buried deep inside CJCSI 4310.01, has significant impact on the AF munitions stockpile manager. Basically, it dictates that once a pre-positioned ship filled with AF munitions is emptied in support of a combatant commander, the AF looses control over the ship. At that point, it becomes part of common sealift pool and the AF munitions manager must now compete for this vessel (that they have paid for) against all other sealift requirements. Certainly there is strategic level planning implications to this policy.

Air Force. Overarching guidance on munitions shipments are found primarily in AFPD 24-1, *Preparation and Movement of Air Force Material*, and AFI 24-201, *Cargo Movement.* Both

documents provide basic guidance on procedures for planning, documenting, and funding shipments. AFI 24-201 does refer specifically to munitions shipments, primarily in regards to special procedures associated with their hazardous nature.[23] AFI 21-201 also provides additional munitions transportation policy regarding tracking of shipments via the Global Transportation network. Additionally, multiple 11A series technical orders provide specific guidance for preparing munitions for shipment in various modes.[24]

Accountability

For the purposes of this paper, accountability simply means the ability to account for, or "see," items throughout the deployment process. This entails accurate documentation through the complete chain of custody. This chain starts at the original location, continues through the transportation system into arrival at the required location, and terminates with tracking of subsequent expenditures. It can easily be argued that this is the most critical portion of resupply because all of the other steps in the process spring from an accurate portrayal of where specific assets are. One hundred percent accountability is especially critical with munitions items given their potential for harm if lost or stolen

Department of Defense. The DoD has issued a number of publications that relate to munitions accountability. From an overarching prospective, JV2020 directs the services to "implement fixed and deployable automated identification technologies and information systems that provide accurate, actionable total asset visibility."[25] This has been achieved to date through a combination of technologies including the extensive use of RF tags. Major General William Welser, the current Director of Operations and Logistics at US Transportation Command, specifically credited the use of the RF tags for enabling timely resupply during OEF and Operation Iraqi Freedom. More specifically, several CJCSI instructions including CJCSI

4120.01A *Uniform Material Movement and Issue Priority System*, and CJCSM 3150.14A, *Joint Reporting Structure Logistics*, detail the mechanisms for allocating and tracking shipment priorities. In enclosure D to CJCSM 3150.14, munitions status reporting (MUREP) is introduced. This report provides the "CJCS, CINC's, and Military Services with the ability to monitor critical munitions items worldwide that affect warfighting capabilities during hostilities, emergencies, or exercises."[26]

Air Force. The Air Force has also adopted a series of documents that provide detailed guidance for accountability of munitions assets. Top-level guidance is found primarily in AFI 21-201, *Management and Maintenance of Non-Nuclear Munitions*. Part two of this document contains over 100 pages of guidance on munitions accountability procedures. Included in this instruction are such nuts and bolts issues as establishment of an accountable officer, how to fill out and control accountability related documents, and basic inventory procedures. There is also a short section on deployed munitions management. This two page section contains guidance on mobility munitions accounts and accounting for contingency support munitions. Given historical problems with deployed ammunitions accountability and an increased number of contingency locations served today, additional guidance in this area would appear to be required.

Several additional documents provide more specific guidance on accountability for Air Force munitions. Air Force Computer System Manual 21-824 Volumes 1 and 2 provide detailed guidance in operating the Combat Ammunition System (CAS), the primary accounting tool for AF munitions worldwide. Several of the 23 series (supply) instructions pertaining to management of government property and reports of survey are also applicable. Again, because of the grave consequences that might result from a loss of munitions, accountability guidance is typically supplemented all the way down to the base level. Examples include 18th Wing

Instruction 21-201, *Munitions Accountability Procedures* and Ogden Air Logistics Center WM Operating Instruction 21-201, *Inventory and Inspection Procedures for the Afloat Prepositioned Fleet Program.*

Munitions Handling

In large part, due to munitions potential safety hazards, there is a plethora of guidance concerning munitions handling. Munitions handling is defined here as activities to store, maintain, assemble and deliver to the appropriate aircraft, various munitions including bombs, missiles, and medium caliber munitions. Guidance for munitions handling operations comes primarily from the DoD and AF and supplemented as appropriate.

Department of Defense. DoD munitions handling regulations are directed primarily at safety related concerns. DoD Standard 6055.*9, DoD Ammunition and Explosive Safety Standards,* establishes uniform safety standards mandatory for all DoD components working with munitions. This manual establishes basic guidance including the requirement to "limit the exposure of a minimum number of persons, for a minimum time, to the minimum amount of ammunition and explosives consistent with safe and efficient operations."[27] Other relevant policy includes establishment of all basic munitions safety programs from lightening protection to facility construction. Additionally, basic munitions storage compatibility groups are established. Specific handling guidance on a particular weapon system or location, however, is left to the individual DoD Components.

Air Force. The Air Force relies on a combination of instructions and technical orders to provide extremely detailed guidance on munitions handling operations. AFI 21-201 provides generic policy to all AF munitions locations. On one level, this instruction gives guidance on how to organize handling operations. On a more technical level, AFI 21-201 also includes

detailed assignment of responsibility for handling operations to the point of mandating minimum requirements for crew chiefs briefings.[28] Other relevant instructions include AFI 91-201, *Explosive Safety Standards*, and various Air Force Occupational and Environmental Safety, Fire Prevention and Health Instructions, which detail safety restrictions for munitions handling operations.

AF technical orders (T.Os) provide additional detail relevant to munitions handling operations. For munitions operations, there are literally dozens of T.Os specific to various weapon systems. For example, T.O. 11A-12-7 provides storage and maintenance procedures for proximity sensors. More comprehensive guidance is found in 11A-1-63, *Munitions Assembly Procedures, Inspection and Assembly of Nonnuclear Munitions*. This T.O. contains "procedures for personnel inspecting and assembling conventional munitions."[29] This guidance "applies to the full spectrum of bomb assembly operations from peacetime, single bomb assembly to wartime/exercise, mass bomb buildup operations."[30] A figure from this T.O. is provided below to give a sense as to the level of detail in this publication. Taken as a whole, the instructions and T.O.s provide detailed guidance for munitions handling operations.

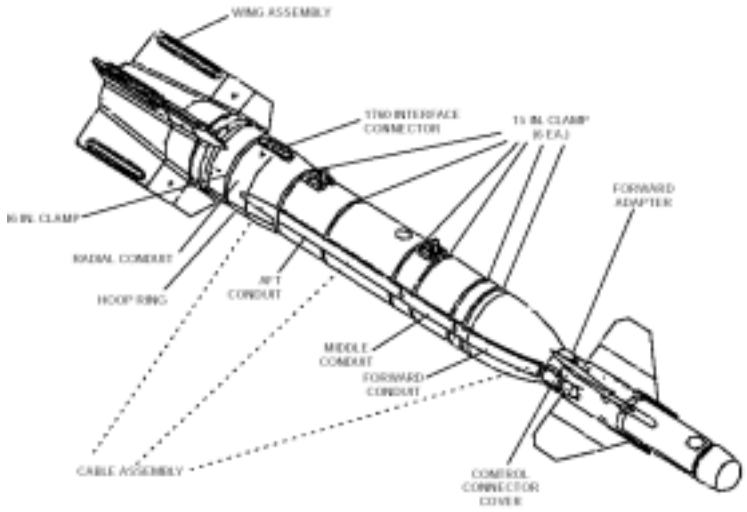

Figure 1 Detailed Munitions Guidance in Technical Order 11A-1-63

Notes

[1] Joint Publication 1-0, *Joint Warfare of the Armed Forces of the United States*, 14 November 2000, IV-10.

[2] Joint Publication 3-0, *Doctrine for Joint Operations*, 10 September 2001, II-7-II-8.

[3] Joint Publication 4-0, *Doctrine for Logistic Support of Joint Operations*, 6 April 2000, i.

[4] Ibid.

[5] Ibid.

[6] Ibid., A1-A-4.

[7] Ibid., C1-C5.

[8] Ibid., C3.

[9] Joint Chiefs of Staff, *Joint Vision 2020*, n.p., on-line, Internet, 23 November 2002, available from http://www.dtic.mil/jointvision/jv2020.doc.

[10] Air Force Doctrine Document 2-4, *Combat Support*, 22 November 1999, 2-3.

[11] Ibid., 6-7.

[12] Ibid., 22.

[13] Department of the Air Force, *America's Air Force: Vision 2020*, 2000, p 1.

[14] Ibid.

[15] Air Force Policy Directive 21-2, *NonNuclear and Nuclear Munitions*, 8 June 1993, 2.

[16] Air Force Instruction 21-201, *Management and Maintenance of Non-Nuclear Munitions*, 1 December 2000, 110.

[17] Joint Publication 4-01.8, *Joint Tactics, Techniques and Procedures for Joint Reception, Staging, Onward Movement, and Integration*, 13 June 2000, V8.

Notes

[18] Air Force Instruction 10-400, *Aerospace Expeditionary Force Planning*, 16 October 2002, 1.

[19] Air Force Instruction 10-403, *Deployment Planning and Execution*, 9 March 2001, 64.

[20] Air Force Instruction 10-404, *Base Support and Expeditionary Site Planning*, 26 November 2001, p 116-122.

[21] Joint Publication 4-0.1, *Joint Doctrine for the Defense Transportation System*, 17 June 1997.

[22] Chairman Joint Chiefs of Staff Instruction 4310.01, *Logistic Planning Guidance for pre-Positioning Ships*, 10 October 1993, 2.

[23] See also AF Joint Instruction 24-210 *Packaging of Hazardous Materials*

[24] Examples include T.O. 11A-1-61-1 *Storage and Outloading Instruction—Conventional Ammunition*, and T.O. 11A-1-65 *Munitions 463L Palletization for Air Transport*.

[25] Joint Chiefs of Staff, *Joint Vision 2020*, n.p., on-line, Internet, 23 November 2002, available from http://www.dtic.mil/jointvision/jv2020.doc.

[26] Chairman Joint Chiefs of Staff Manual 3159.14A, *Joint Reporting Structure Logistics*, 30 April 2000, D-1.

[27] Department of Defense Standard 6055.9, *DoD Ammunition and Explosive Safety Standards*, July 1999, 2.

[28] Air Force Instruction 21-201, *Management and Maintenance of Non-Nuclear Munitions*, 1 December 2000, 36.

[29] Air Force Technical Order11A-1-63, *Munitions Assembly Procedures, Inspection and Assembly of Nonnuclear Munitions*, 18 April 1995, ix.

[30] Ibid.

Part III

Case Study in Policy Execution: Operation Enduring Freedom

> *"When it comes down to the wire and the enemy is upon you and you reach into your holster, pull out the pistol and level it at your adversary, the difference between a click and a bang is logistics."*
>
> Brig Gen Arthur B Morrell III

In response to the cowardly terrorist attacks of September 11 2001, the leadership of the United States began what has been described as a "war on terrorism." The US national objectives in this war include "the destruction of all components of the al Qaeda network worldwide and other radical groups dedicated to attacking the US and denying the terrorists safe havens and other forms of support…The ultimate objective of these efforts should be to reduce drastically the ability of international terrorist groups to inflict political, economic, psychological, and other damages on the United States and its allies."[1] On 7 October 2001, President Bush announced that these objectives would be met in part by the use of military force in Afghanistan. This force would both remove Taliban forces from leadership in Afghanistan and prevent al Qaeda the use of the country as a staging base. This effort became known as Operation Enduring Freedom (OEF).

In response to OEF, the Air Force used its Aerospace Expeditionary Force structure to support air operations at multiple bases throughout the area. Indeed, from the start of the air war on the evening of 7 October, sorties were launched from locations ranging from Whiteman AFB

to nine separate overseas locations. While some portions of the AEF structure were already in place in support of Operations NORTHERN and SOUTHERN watch, additional operating locations were established right from the beginning of the war. Munitions resupply to these forward locations began immediately upon deployment.[2]

OEF provides a good case study to determine if munitions resupply guidance is sufficient to support operations carried out under the AEF concept. In order to answer this question, the researcher conducted multiple interviews with key munitions personnel supporting OEF.[3] To be consistent, interview results are subdivided in the same manner as the earlier munitions resupply guidance section (i.e. overarching issues, deployed operations, transportation, accountability, and munitions handling).

Before presenting the interview results, it's important to note one limitation in the use of OEF as an AEF case study. Because of the location of the conflict and the world situation when it began, AF personnel assigned to AEFs were already deployed and conducting operations in the CENTCOM AOR prior to the start of OEF. This resulted in some of the munitions resupply activities that might be associated with an AEF deployment order (little notice, new and unimproved location) not being fully tested in this scenario.

Munitions Resupply Guidance and OEF

Despite the existence of munitions stocks already in theater, munitions resupply for Enduring Freedom was no small task. During the period from 7 October 2002 to 10 March 2003, the AF shipped approximately 6,020 tons of munitions via air and an additional 20,289 tons via sea to support continued air operations against Taliban and al Qaeda targets.[4] Table 1 lists selected munitions by type and number employed to-date during this operation.

Table 1 Munitions Expended During Operation Enduring Freedom

Munitions Type	*Description*	*Total Used*
CBU-103	Cluster Bomb Unit with Wind Corrected Munitions Dispenser	652
CBU-87	Combined Effects Munitions	168
GBU-24	PaveWay III, 2000 pound Low Level Laser Guided Bomb	45
GBU-31	Joint Direct Attack Munitions	6,109
GBU-10/12	PaveWay II, GBU 10=2000 pound, GBU 12=500 pound	1,349
Mk-82	500 pound unguided bombs	8,202
Mk-84	2000 pound unguided bomb	230
7.62MM	Ground Defense, also MH-53, HH-60	334,643

Source: Agile Munitions Support Tool, OEF Expenditures, as of March 2003

In order to find out whether sufficient guidance existed to make this tremendous effort possible, a series of interviews were conducted with key representatives from the munitions management community. Interviews were conducted with representatives of Air Staff, Headquarters Air Combat Command (ACC), Headquarters Pacific Air Command (PACAF), Headquarters United States Air Forces in Europe (USAFE), and the Air Force Ammunition Control Point (ACP). Questions pertained to the interviewees' particular role in support of OEF and whether they thought adequate guidance existed relative to their role in several categories. Responses to the questions are highlighted below.

Overarching Issues

Several themes emerged from the interviews that reach across multiple aspects of munitions resupply. These ideas are outlined in this section.

The first theme is that while the AF as a whole might view supporting OEF via the EAF construct as revolutionary, the munitions resupply process to support OEF is not substantially different that that used to support DESERT STORM. Mr. Dan Fri, Air Force Munitions Stockpile Manager, noted that because ammunition is a commodity like fuel (vice equipment), it has long been distributed separate from the deploying unit.[5] The Standard Air Munitions

Package (STAMP) program predated the EAF concept and was designed to ship munitions anywhere in the world to support immediate combat operations. Guidance for the execution of the STAMP program does exist and allows for munitions stocks to be requisitioned in conjunction with an EAF deployment.[6] Representatives from ACC echoed this theme. However, they noted that what had changed within munitions operations and the EAF is not in munitions supply, but the sourcing of munitions personnel to deploy as part of EAF taskings. Interestingly, deployment of munitions personnel is one area where the AF is currently working to create guidance. As part of this effort munitions leadership on the Air Staff has pushed to have every possible munitions manpower position coded to support an AEF.[7]

While AF munitions experts agree that that the EAF has not significantly changed the manner in which munitions resupply is performed, they were quick to note that this did not mean guidance for munitions supply was sufficient in all categories. Perhaps Mr. Greg Osbun, Chief of Munitions Planning for PACAF, framed this issue best. He wrote “yes munitions stocks were "expeditionary" before the AF was...and in truth...the guidance has been thin...over the last year and a half we've gotten quite an education, but it has been on the fly as they say.”[8]

The interviewees identified two general faults with the current guidance. First, it was too difficult to put it all together and then use it in a timely manner. Second, the guidance lacked specificity at the operational and strategic level. I’ll address both issues further below.

The interviewees were unanimous in their critique that munitions resupply guidance existed in too many separate documents and was produced by too many different organizations to be useful. Finding and using this guidance in a time critical environment like OEF was overly burdensome.[9] There simply was not enough time to exhaustively research available guidance when questions arose during a crisis. When attempts are made to research available policy, the

disjointed nature of the documents led to more frustration than guidance. Both USAFE and PACAF munitions personnel commented that they had attempted to locate doctrine concerning the transfer of munitions from one Combatant Commander to another but were unable to find definitive guidance. As such, they simply used their best judgment.[10] In fact, several documents, including AFI 21-201 and JP 4.0, speak to munitions transfer issues. Unfortunately, without a way to quickly know where the guidance was and what it directed, it was of little value in this urgent environment.

The second theme discovered during the OEF research was that munitions resupply guidance was lacking for processes that occur at the operational and strategic level of war. All interviewees commented at some point that the detail contained in munitions guidance, such as the 292 page AFI 21-201, was of great help to the shop chief but little help to the staff. Given the void in operational level guidance, the staff munitions experts proceed to make the system work by applying their experience to any particular OEF crisis, in essence applying a band-aid and moving on. For example, CMSgt John Hough noted that there is no guidance on how to run a TACP and no policies across the AF on how the functions of a TACP should be accomplished.[11] Mr. Greg Osbun echoed this sentiment. He added that he believed up to 95% of the work being done in a TACP supporting OEF was done based on the experience of the people working at the time, not in conjunction with any formal guidance.[12] Mr. Osbun also said he believed that ideally, a person should be able to walk into the TACP in USAFE or PACAF and feel comfortable because the same procedures were in place in both.[13] A lack of documented guidance currently prevents this from happening.

MSgt Tim Ouezts, a munitions planner on the PACAF staff, related an example of experience and a “will do” attitude taking over where guidance leaves off. At one point during

OEF, B-1 operations at Diego Garcia were almost stopped because of a shortage of a simple Kevlar lanyard used for munitions loading operations. Munitions personnel from across PACAF and the ACP put together a contract to buy the lanyards on short notice, then got the lanyards FEDEXed as far as Guam. From there, local munitions personnel got the package and talked an aircrew bound for Diego Garcia into taking the package with them. Certainly one would not expect a detailed policy letter to cover a contingency such as this; however, overarching policies for munitions resupply at the operational and strategic level would facilitate a general understanding of how these problems should be addressed.

Deployed Operations…Receipt, Integration and Beddown

Most interviewees did not see any problems with receipt, beddown and integration of munitions stocks as part of OEF and felt sufficient guidance was available. However, Mr. Mike Gavin from the ACC munitions staff noted that while the munitions might not be a problem, there were guidance issues with beddown and integration of the **personnel and equipment** deploying to take care of AEF deployments in support of OEF. Specifically, he commented that during AEF deployments that set up new operating locations in support of OEF, deployed units left equipment at the FOL. This is a good thing if the operations at the base will be long-term, as it reduces subsequent airlift requirements. However, it also means that equipment shortages develop at home unit locations, thus hampering training opportunities. Guidance for deployment of equipment is currently evolving but does not yet address this problem.[14] Finding manning to support munitions resupply efforts during OEF was also an issue. Given the worldwide manning of munitions personnel, it is nearly impossible to fill all of the munitions unit type codes requested to support OEF. ILMW is currently working on the establishment of guidance in the

form of scalable, modular, unit type codes to better support current and future AEF deployments.[15]

Transportation

Interviewees saw no issues with the guidance pertaining to the packaging and shipping of munitions items for OEF. In other words, field guidance for how munitions should be prepared for shipment was thought to be sufficient. As noted above, there was general agreement among the interviewees that there was insufficient guidance on the operational and strategic level transportation issues. Primarily, this refers to the mechanisms used to direct stockpile movement. For example, CMSgt Hough commented that there was confusion on what USAFE munitions stocks, allocated to EUCOM, could be sent to CENTCOM in the early stages of OEF.[16] A request for JDAM tail kits from Naval units supporting OEF was only supported by a "will do" attitude in the heat of battle, not because any guidance told the USAFE munitions staff how to make it happen.[17]

Accountability

Interviewees saw guidance for accountability as sufficient. They noted that satisfactory procedures were in place to account for munitions throughout the resupply chain. However, there were portions of the accountability process that could potentially be improved by better guidance. For example, ACC observed that there was a tendency for multiple units deploying with mobility munitions to combine these munitions stocks at the FOL. This creates problems with maintaining lot number integrity; critical to ensuring unstable munitions are not used.[18] Visibility over assets arriving at forward deployed locations was also identified as a problem. Mr. Dan Fri, AF munitions stockpile manager, commented that the current AF automated system, Combat Ammunition System (CAS), is to slow to show received assets. He noted that it

routinely takes 5 days after actual receipt by the unit for the transaction for show up in CAS.[19] While guidance is not directly responsible for this delay, aggressive implementation of advanced accounting technologies mandated by guidance currently accepted as policy could reduce this problem [20]

Munitions Handling

As mentioned above, there is a significant volume of guidance for munitions handling. The sufficiency of this guidance for OEF was confirmed with all interviewees. In fact, none of the interviewees mentioned could remember any instance where questions concerning munitions handling procedures were raised during any part of OEF. This doesn't mean minor changes to munitions related technical orders might not be identified in the normal course of contingency operations; however, it appears clear that sufficient guidance is in place and used by technicians.

Summary

OEF provided an excellent opportunity to examine munitions resupply guidance. Through interviews with munitions leadership across the AF, general trends were identified. The EAF concept has not yet had a significant impact on munitions resupply primarily because munitions are distributed as a commodity. Current guidance is extensive but spread over a variety of documents from different sources and is, therefore, difficult to use. What guidance is available is primarily directed at field level operations and is not supportive of operations at operational or strategic levels.

Notes

[1] Dr. Milian Vego, "What Can We Learn From Enduring Freedom?" Naval Institute Proceedings, July 2002, n.p., on-line, Internet, 10 December 2002, available from http://www.usni.org/proceedings/articles02/provego07.htm.

[2] MSgt Julie Bitney, Standard Air Munitions Package/ Standard Tanks, Racks, Adapters, and Pylon Packages Program Manager, interviewed by author, 11 March 2003

[3] The questionnaire used for the interviews is located in Appendix B of this paper.

[4] E-Mail to author from Daniel Fri, Munitions Stockpile Program Manager, 11 March 2003.

[5] Daniel Fri, AF Munitions Stockpile Manager, interviewed by author, 11 March 2003.

[6] MSgt Julie Bitney, Standard Air Munitions Package/ Standard Tanks, Racks, Adapters, and Pylon Packages Program Manager, interviewed by author, 11 March 2003.

[7] CMSgt Michael Robertson, ACC Command Munitions Functional Manager, interviewed by author, 4 March 2003.

[8] E-mail to author from Greg Osbun, Chief Munitions Planning Branch, PACAF, 12 March 2003.

[9] Greg Osbun, Chief Munitions Planning Branch, PACAF, interviewed by author, 4 March 2003.

[10] CMSgt John Hough, USAFE Command Munitions Manager, interviewed by author, 3 March 2003.

[11] Ibid.

[12] Greg Osbun, Chief Munitions Planning Branch, PACAF, interviewed by author, 4 March 2003.

[13] Ibid.

[14] Michael Gavin, ACC Munitions Logistics Management Specialist, interviewed by author, 4 March 2003.

[15] Ibid.

[16] CMSgt John Hough, USAFE Command Munitions Manager, interviewed by author, 3 March 2003

[17] Ibid.

[18] Michael Gavin, ACC Munitions Logistics Management Specialist, interviewed by author, 4 March 2003.

[19] Daniel Fri, AF Munitions Stockpile Manager, interviewed by author, 11 March 2003.

[20] See specifically JV 2020, the section on "Focused Logistics" for direction on technology to support total asset visibility.

Part IV

Conclusions and Recommendations

"There must be great care taken to send us munition and victual whithersoever the enemy goeth."

— Sir Francis Drake

This research effort was conducted in order to determine if sufficient guidance exists for munitions resupply efforts under the EAF construct. To answer this question, current guidance was reviewed and participants in the EAF process in support of OEF were interviewed. The conclusions and recommendations that follow flow from this effort. Suggestions for further research relating to this topic are included in appendix C of this paper.

Figure 2 Assembled Munitions Ready to Load

Conclusions

The primary conclusion of the research is that the move to the EAF concept has not significantly altered the processes associated with munitions resupply; therefore, no significant modifications to existing guidance, **specifically in support of this concept,** are necessary. Because ammunition is a commodity, and does not deploy with an assigned unit (the exception being bomber flyaway), it has been *expeditionary* in nature for some time. Indeed, AF "swing stocks," transported using air and sea lift, provided munitions to deployed locations for multiple contingencies since the 1980s. These same swing stocks, while not originally designed to be expeditionary per se, are now the primary means of resupplying AEF munitions

What the adoption of the EAF concept (combined with the stresses put on the AF munitions community by 10 plus years of supporting increased operations tempo) **has done is to expose deficiencies in munitions resupply guidance that have existed for some time**. This can be likened to a vintage car that looks great in the garage, but has no engine to provide the power necessary to get the vehicle moving. Munitions resupply guidance is sufficient at the tactical level--telling a shop chief how to prepare munitions for transportation or organize a munitions inspection section. However, guidance fails to provide direction at the operational or strategic level of munitions operations. This conclusion was validated in interviews with multiple leaders from throughout the munitions community reflecting upon their experiences in OEF. All agreed that the guidance that they need to perform theater or strategic level munitions resupply is not adequate. This lack of guidance produces two separate results. In the short term, the nature of the men and women working in the ammo community, given their decades of experience, make munitions resupply happen by the power of their individual commitment to the mission. However, in the long term, insufficient guidance prevents the munitions community from clearly

advocating the requirements associated with munitions resupply to the larger AF community. This negatively impacts their ability to get the resources necessary to ensure long-term munitions resupply program viability. As the USAFE command munitions manager noted: "The lack of documented thought or a "place" for all of this [doctrine/policy/guidance on munitions resupply] effects readiness just as surely as Johnny's missing anthrax shot or the lack of a maintenance group organization does. Unfortunately, its absence can't yet be measured or articulated so the issues won't be funded…and that will effect EAF readiness for sure."[1]

In addition to the general conclusion noted above, the following specific conclusions were developed during the research for this paper:

Guidance is plentiful…but finding and integrating it is difficult.

The are literally hundreds of separate sources for guidance that directly bear on the munitions resupply process as conducted in OEF. In the crises environment that typically accompanies munitions movement in a conflict, there simply is not enough time for key players to find policies and apply them as appropriate. Instead, they rely on their personal knowledge, the knowledge of the other key players in the system, and the way they believe the processes should work to get the munitions where they need to go.

Sufficient guidance exists for operations at the tactical level.

This became apparent during the literature review portion of the research and was confirmed by interviewees. As a result of the hazards associated with munitions, procedures for working with munitions are sufficiently addressed in publications such as AFI 21-201, AFI 91-201, and T.O. 11A-1-63. Guidance for operations including handling, assembling, packaging, and transporting are for the most part sufficient for operations in an EAF environment.

Additionally, management functions from the munitions flight level downward were found to be generally sufficient.

There is insufficient guidance for processes that are performed primarily at the operational and/or strategic level.

These operations include planning functions for weapon system fielding or beddown from an Air Force wide perspective. Included in this broad planning function is guidance relating to long-term planning of munitions stocks (ratio of depot stocks to stocks afloat), and management of war reserve material funding for munitions support to the EAF. Sourcing of munitions personnel and management of equipment in an EAF environment are also operational level processes that currently have insufficient guidance. For these activities, interviewees noted that very little guidance exists, and what guidance there is can be hard to locate and tie together.

Recommendations

The following recommendations are made in support of the conclusions drawn from research conducted for this paper.

Creation of additional guidance

Create additional guidance pertaining directly to munitions resupply operations at the operational and strategic level. Several specific documents should be created as outlined below.

For the first document, AF/ILMW, working with the IL Doctrine and Strategy Division (AF/ILXS) and the Air Force Doctrine Center, should create an AF doctrine document (AFDD 2-4._), *Munitions Combat Support,* specific to munitions management. This document would lay out the basis for a **systems approach** to AF munitions stockpile management. Sections could include:

- 1. Philosophy of AF munitions management.

- 2. Role of DoD entities, specifically USA as the Single manager for Conventional Munitions
- 3. Requirements for AF munitions
- 4. Beddown of new AF munitions
- 5. Stockpile allocation philosophy (including EAF driven allocation requirements)
- 6. Munitions Infrastructure requirements (initial and maintenance/upgrade)

The goal for this document is twofold. First, it would begin to fill the void in operational/strategic level guidance for munitions professionals. Second, this document would provide justification for funding and execution of basic munitions programs. These programs include infrastructure development and maintenance, system beddown consideration, theater ammunition storage site resourcing, and new shipping techniques such as the Containerized Ammunition Distribution System (CADS).

For the second document, OO-WM, in conjunction with AF/ILMW, should create an AF policy document (AFPD 21-20_), *Air Force Stockpile Management,* incorporating material currently in chapters 15 and 33 from AFI 21-201. This document would provide basic philosophical guidance for why and how the stockpile is allocated. It should address issues such as:

- 1. The legitimacy of theater munitions storage.
- 2. Desired ratio of stocks in:
  - STAMP/STRAPP
  - Afloat Prepositioned Fleet
  - Stateside munitions depots
  - Theater munitions depots.
- 3. Basic munitions procurement and sustainment.
- 4. Commitment to the Containerized Ammunitions Distribution System (CADS)
  - Manning and infrastructure issues resulting from CADS

For the third document, ILMW should work with OO-WM to create an AF policy document (AFPD 21-20_), *Providing Munitions to the EAF*, that describes the processes necessary to support the EAF concept. Current distribution and stockpile allocation decision-making processes would be described. Unique problems associated with munitions deployed to a

contingency base (setting up a storage area, deployment of personnel, equipment deployment) would also be presented. This document would provide written guidance to support munitions resupply in the EAF concept, enabling munitions managers at the theater and ILMW level to justify EAF required personnel, equipment, and facilities.

Eliminate command supplements to AFI 21-201

Despite its almost 300 page heft, every MAJCOM supplements AFI 21-201 to some degree. Often, the information contained in these supplements is not "unique" to a particular MAJCOM, but rather information that could, and should, be standardized across the AF munitions community. Thus, AFI-21-201 turns into a watered down version of what the various command munitions functional managers will unanimously agree on. What they don't agree on is added to their command supplements. Elimination of MAJCOM supplements forces greater congruency on munitions guidance across the AF. This should reduce possible confusion when personnel from units in different MAJCOMs deploy to the same FOL

AF AMMO Webpage development

ILMW should develop a webpage modeled after the current OO-ALC/WM website. The webpage would serve as a one-stop shop for munitions support during a contingency. Links to all guidance on resupply processes would be provided as well as access to the Agile Munitions Support Tool already established on the OO-ALC/WM webpage. Further, links to contingency lessons learned and latest EAF policies would be included.

Add a contingency munitions management class to AFCOMAC curriculum

This class would be for E-7's and above (including all officers) and run for 3 days prior to the arrival of the main AFCOMAC class. The course would cover all aspects of munitions

stockpile management and munitions resupply operations in support of deployed or contingency operations. The first two days would consist of classroom instruction focusing of policy review and lessons learned from recent deployments. The third day would be a scenario-based exercise that forces attendees to work through munitions resupply decisions. This scenario would also serve as the beginning point for the AFCOMAC class as currently constructed.

Notes

[1] CMSgt John Hough, USAFE Command Munitions Functional Manager, e-mail to author, 13 March 2003.

Appendix A

Appendix A: Types of Guidance

Over the thousands of years that organized military forces have conducted operations, nations have developed various types of guidance to govern their employment. This is certainly true about the AF today. The type and amount of guidance for any particular effort in the AF is influenced by several factors including the complexity and importance of the area covered and the need to standardize a particular operation. For the purposes of this research effort, three general document groupings will be considered: doctrine, regulations or instructions, and other.

Doctrine.

Doctrine is classically defined as "a principle or position or the body of principles in a branch of knowledge or system of belief."[1] It's the accumulated revealed truths in any system, the articles of faith that history has shown to be the best manner in which a task can be accomplished. In the case of the armed forces, doctrine could be said to equal the principles that should guide the use of force to defeat the enemy. Indeed, in Air Force Doctrine Document 1 (AFDD-1), doctrine is said to consist "of the fundamental principles by which military forces guide their actions in support of national objectives…the linchpin of successful military operations."[2] The phrase "fundamental principles" provides the key to understanding the use of military doctrine. It implies that doctrine is broad in nature, designed to address generic situations and provides general guidance. One would not expect to find detailed information on

how to drive a tank or fly a jet aircraft in doctrine, but rather the principles that would cause the tank or aircraft to be employed most effectively. Again, this is described in AFDD-1 when it states, "Air Force doctrine is meant to codify accumulated wisdom and provide a framework for the way we prepare for, plan, and conduct air and space operations."[3]

The fact that doctrine is broad in nature should not be taken as an indication that it cannot be comprehensive. Figure 3 below is an illustration of the doctrine presently in use or being developed in support of joint US military operations. It contains 2 "capstone," 11 "keystone" and 100 other doctrine documents. These documents range from the overarching Joint Publication (JP) 1, *Joint Warfare*, to the more restricted JP 1-06, *Joint Tactics, Techniques and Procedures for Financial Management During Joint Operations*.

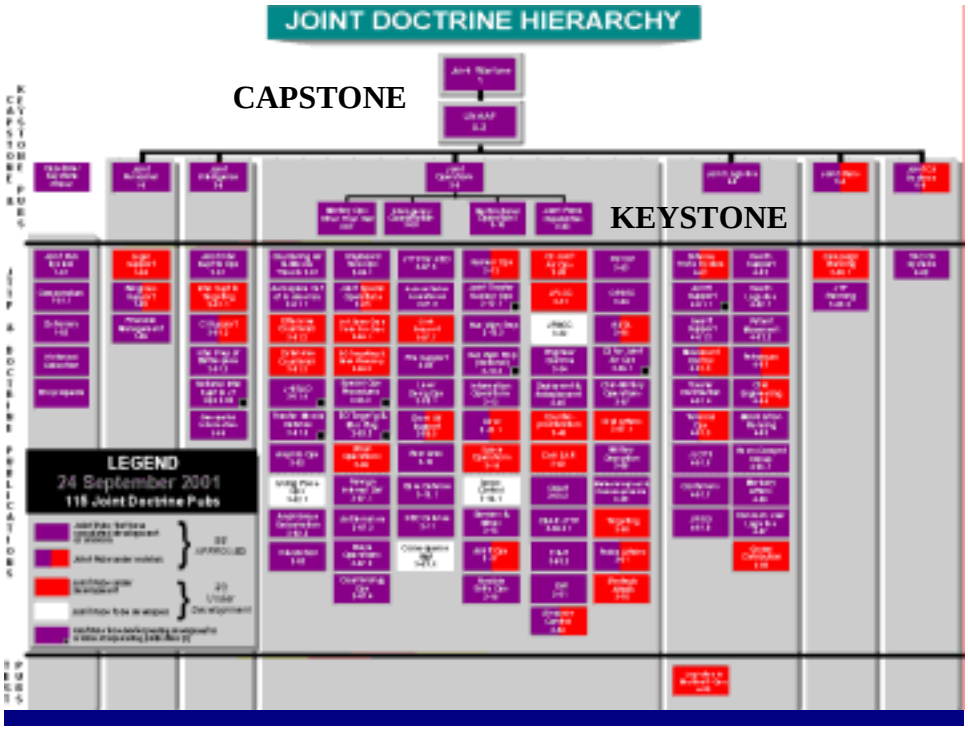

Figure 3: JCS Joint Doctrine Hierarchy

Regulations/Instructions/Directives

Regulations, instructions, and directives are grouped together because they share two key characteristics; first, unlike doctrine which is suggestive in nature, these types of documents mandate obedience; and second, they contain more detailed guidance than doctrine, answering questions regarding "how" something is to be accomplished. Both characteristics will be discussed further below.

Because the consequences of the application of military power are so grave, standards are established to govern its use. Regulations are nothing more than the manner by which these standards are implemented. Obedience to regulations is not done by preference, but is mandated. For example, the Department of Defense (DoD) defines "directives" as "documents containing what is **required** by legislation, the President, or the Secretary of Defense to…regulate actions or conduct by the DoD Components within their specific areas of responsibilities."[4] Perhaps an even clearer example of the mandatory nature of these documents is that all AF Instructions come with the following disclaimer "COMPLIANCE WITH THIS PUBLICATION IS MANDATORY."

The second characteristic these documents share is that they are much more detailed than doctrine, often outlining exactly "how" a particular task is to be accomplished. For example, CJCSI 4310.01, *Logistics Planning Guidance for Pre-Positioning Ships*, lists specific responsibilities for all parties in this process. In perhaps a more extreme example, 341st Space Wing Instruction 21-203, *Munitions Accountability Procedures*, requires 34 pages to "aid Commanders, Custodians, and munitions users in munitions accountability procedures."[5] This instruction provides line-by-line instructions on how to fill our several different types of forms and letters. This instruction was not chosen because it is extreme in nature but more as a representative of the level of guidance offered within this group of documents.

Other Sources of Guidance

Because of the wide variety of operations members of the DoD engage in regularly, there are several different alternative sources for guidance that don't fall neatly into the two categories mentioned above. These alternative sources can cover a range of issues down to a single transaction. Additionally they can be issued by organizations ranging from the Air Staff to a deployed flight, and be transmitted via diverse means such as official message traffic and personal e-mail. Three of the more common types of guidance are Concept of Operations (CONOPS), various planning documents (ranging from theater wide Operational Plans to specific Base Support Plans (BSP)), and strategic or vision statements.

Notes

[1] Webster's Third International Dictionary, 1971, p 666.

[2] Air Force Doctrine Document One, "Basic Air Force Doctrine," September 1997, p 1.

[3] Ibid.

[4] Department of Defense Washington Headquarters Services, "*About DoD Issuances*," n.p., on-line, Internet, 26 February 2003, available from http://www.dtic.mil/whs/directives/general.html.

[5] 341st Space Wing Instruction 21-203, *Munitions Accountability Procedures*, 3 September 2002, p 1.

Appendix B

Appendix B: In the Beginning…Where Guidance Originates

The Senior Airman Security Forces troop standing guard at a deployed location is probably unaware of the complex web of policies that are in place that direct where she will work, what she will be doing, why she will be doing it, and how it will be done. Increasingly, as joint and combined operations become the normal state of the Air Force, the policies that answers these questions comes from a growing variety of sources. These sources are both traditional (unit or command) and non-traditional (environmental regulations, host country regulations). Whatever the source of the guidance is, two key issues are important; the target or effected audience for the document, and the degree to which this target audience is aware of the existence of this guidance. In response to the first issue, it's possible for a process to have exceptional guidance at the strategic level but fail to provide adequate direction for those carrying out the process at a tactical level. For the second issue, guidance issued from an organization that never is received by its intended audience is, for practical purposes, useless. Even the most clearly written guidance, when not accessible in a timely manner, is merely wasted effort for the organization from which it originated. Four of the more common sources of guidance will be discussed next.

Department of Defense

The DoD, through the issuance of instructions, directives, and joint doctrine, provides significant guidance to all organizations that fall under its purview. Indeed the DoD

Communications and Directives Directorate web page notes that there are some 18 different types of issuances that describe DoD policy. These documents include instructions, directives, standards, and manuals.[1] The guidance contained in these documents ranges from the specific to the suggested. For example, Chairmen Joint Chiefs of Staff (CJCS) Instruction 4120.01A provides exact application procedures to request a CJCS project code used to determine supply priorities[2], while DoD's Joint Vision 2020 provides only an "overarching focus" of the direction military leaders should prepare and plan for by the year 2020. DoD makes these policies, when unclassified, available through printed material and a comprehensive web site that provides immediate access to all of the various types of policy documents. Because of the nature of the organization, most of the guidance issued is joint in nature and provides little service specific direction.

Headquarters Air Force (HAF)

HAF issues policies designed for implementation across the AF. Accordingly, the guidance tends to be general in nature, outlining processes to be followed across all AF bases and units. Like the DoD, the AF publishes both broad doctrine and specific instructions. Doctrine is published in support of the AF "distinctive capabilities" (until recently "core competencies"). For example, AFDD 2-1 covers Air Warfare. Instructions are issued functionally; although, there may be overlap between functions depending on the subject of the instruction. For example, maintenance related instructions are normally labeled with a "21" prefix; however, instructions for creation of a munitions employment plan are found in AFI 10-404. The "10" prefix is reserved for operations instructions.

Major Command

Air Force Major Commands (MAJCOMs) are created to support a particular functional (for example Air Force Material Command) or geographic (for example Pacific Air Forces) responsibility. They issue guidance to cover two primary areas. First to refine implementation of Air Force guidance, tailoring it to suit the specific conditions that exist within a particular command. Second, to create guidance where the need is specific to the MAJCOM. For example, PACAF implements AFPD 21-1 "Managing Aerospace Equipment Maintenance," with PACAFI 21-102 "Monthly Maintenance Summary Reporting Procedures." The PACAFI contains directions on reporting equipment status for equipment that is specific to PACAF. Similarly, AFMCPD 21-1 covers depot maintenance procedures, a process that is unique to AFMC

Specific Locations

Finally specific locations may issue guidance to support operations unique to that installation. For example, an overseas air base dealing with host nation sensitivities might issue guidance restricting the hours of flying. Also, like with MAJCOM policies noted above, local guidance might be issued to more specifically define how an AF-wide process will be done specific to the unique situations that are peculiar to that location.

Notes

[1] "DoD Issuances," *Washington Headquarters Services Communications and Directives Directorate*, n.p., on-line, Internet, 5 March 2003, available from: http://www.dtic.mil/whs/directives/general.html.

[2] CJCSI 4120.01A, *Uniform Material Movement and Issue Priority System—CJCS Project Codes and Material Allocation Policies During Crisis and War*, 4 September 2000, A-A-1.

Appendix C

Appendix C: Recommendations for Future Research

During the course of this research effort, subjects for additional investigation became apparent. These subjects are tangential to the purposes of this paper but would aid in further refining the topics mentioned in this research.

Creating a systems approach to munitions.

The researcher would investigate how best to establish a cradle-to-grave ***systems*** based approach to the management of AF munitions. Perhaps best identified with the Strategic Air Command; a systems approach that entails the detailed planning necessary to acquire and sustain munitions and their support organization (facilities, personnel, training, equipment) would be the underpinning for all munitions related operations.

Are the cupboards bare?

ACC staff munitions personnel suggested this topic. The premise is that with a decade plus of deployments in support of contingency operations, is there a comprehensive plan to ensure that adequate procurement is being planned to replace stockpile expenditures? For example, bomb bodies have not been a problem in recent years because of surpluses resulting from the Vietnam war. Given the current rates of consumption, has a good analysis been accomplished to ensure that the sources of supply are available to replenish the stockpile?

What is the best allocation of the AF munitions stockpile?

Research would seek to determine the best allocation of the AF munitions stockpile given recent history and most probable future conflicts. What combination of stateside depot, STAMP/STRAPP, theater depot, and APF stocks makes sense given the EAF concept?

Appendix D

Appendix D: Sources of Guidance for Munitions Resupply Operations

The following table contains a more comprehensive list of guidance relating to munitions supply. For reference purposes, a category code column indicates the various processes for which the document provides guidance. The codes are as follows:

1. Overarching Guidance
2. Receipt and Beddown
3. Transportation
4. Accountability
5. Munitions Handling

Table 2 Available Guidance for Munitions Resupply Operations

	Source	Cat
1	*Joint Vision 2020*, (Specifically see "Focused Logistics" section)	1
2	Current Year Defense Planning Guidance	1
3	Current Year Joint Strategic Capabilities Plan	1
4	JP 0-2, *Unified Action Armed Forces (UNAAF)*	1
5	JP 1-01, *Joint Publication System, Joint Doctrine and Joint Tactics, Techniques, and Procedures Development Program*	1
6	JP 1-02, *DOD Dictionary of Military and Associated Terms*	1
7	JCS Pub 3.0 *Doctrine for Joint Operations*	1,2
8	JCS Pub 3.5, *Doctrine for Joint Special Operations*	1
9	JP 3-17, *Joint Doctrine and Tactics, Techniques, and Procedures for Air Mobility Operations*	2,3
10	JP 3-34, *Engineer Doctrine for Joint Operations*	1,5
11	JP 3-35, *Joint Deployment and Redeployment Operations*	2,3

12	JP 4-0, *Doctrine for Logistic Support of Joint Operations*	1,2,3,4
13	JP 4-01, *Joint Doctrine for the Defense Transportation System*	3
14	JP 4-01.2, *Joint Tactics, Techniques, and Procedures for Sealift Support to Joint Operations*	3
15	JP 4-01.3, *Joint Tactics, Techniques, and Procedures for Movement Control*	2,3
16	JP 4-01.4, *Joint Tactics, Techniques, and Procedures for Joint Theater Distribution*	2,3,4
17	JP 4-01.5, *Joint Tactics, Techniques, and Procedures for Water Terminal Operations*	2
18	JP 4-01.6, *Joint Tactics, Techniques, and Procedures for Joint Logistics Over-the-Shore (JLOTS)*	2,3
19	JP 4-01.7, *Joint Tactics, Techniques, and Procedures for Use of Intermodal Containers in Joint Operations*	2,3
20	JP 4-01.8, *Joint Tactics, Techniques, and Procedures for Joint Reception, Staging, Onward Movement, and Integration*	2
21	JP 4-05, *Joint Doctrine for Mobilization Planning*	2,3
22	JP 4-07, *Joint Tactics, Techniques, and Procedures for Common User Logistics During Joint Operations*	2,3
23	JP 4-08, *Joint Doctrine for Logistic Support of Multinational Operations*	1,2,3
24	JP 4-09, *Joint Doctrine for Global Distribution*	1,2,3,4
25	JP 5-0, *Doctrine for Planning Joint Operations*	1,2,3
26	DODI 3020.37, *Continuation of Essential DOD Contractor Services During Crises*	1,5
27	CJCSI 3110.03, *Logistics Supplement to the Joint Strategic Capabilities Plan*	1,2,3
28	CJCSI 3110.11B, *Mobility Supplement to Joint Strategic Capabilities Plan*	3
29	CJCSM 3122.03, *Joint Operation Planning and Execution System Vol II: (Planning Formats and Guidance)*	2,3,4
30	CJCSM 3150.14A, *Joint Reporting Structure Logistics*	2,4
31	DoD 4000.25-2-M, *Military Standard Transaction Reporting and Accounting Procedures*	4
32	CJCSI 4120.01A *Uniform Material Movement and Issue Priority System—CJCS Project Codes and Material Allocation Policies During Crisis and War*	3
33	DoD 4160.21-M *Defense Material Disposition Manual*	4,5
34	CJCSI 4310.01, *Logistics Planning Guidance for Pre-Positioning Ships*	2,3
35	DOD Regulation 4500.32-R *Military Standard Transportation and Movement Procedures*	3
36	DOD Directive 5100.1, *Functions of the Department of Defense and Its Major Components*	1
37	CJSIM 5100.01B *Enclosure H ,Logistics Directorate*	1

38	DoD 5000.2-R *Mandatory procedures for Major Defense Acquisitions Programs and Major Automated Information System Acquisition Programs*	1
39	DoD 5100.76M, *Physical Security of Sensitive Conventional Arms, Ammunition, and Explosives*	4,5
40	DoD 5160.65, *Single Manager for Conventional Ammunition*	1
41	DoD 5160.65-M, *Single Manager for Conventional Ammunition (Implementing Joint Conventional Ammunition Policies and Procedures)*	1,5
42	DoD 5200.1-R, *Information Security Program*	5
43	DoD 6055.9 STD, *DoD Ammunition and Explosive Safety Standards*	5
44	MIL-HDBK-138A, *Container Inspection Handbook for Commercial and Military Intermodal Containers*	5
45	*Air Force Vision 2020*	1,2,4,5
46	Air Force Doctrine Document 2-4, *Combat Support*	1,2,3,4
47	AFMAN 10-206, *Operational Reporting*	4
48	AFI 10-215, *Personnel Support for Contingency Operations*	1,2
49	AFI 10-400, *Aerospace Expeditionary Force Planning*	1,2,3,5
50	AFI 10-401, *USAF Operation Planning Process*	1
51	AFMAN, 10-401 Vol 1, *Operation Plan and Concept Plan Development and Implementation*	1
52	AFMAN, 10-401 Vol 2, *Planning Formats and Guidance*	2,3,4,5
53	AFI 10-402, *Mobilization Planning*	2,3,4,5
54	AFI 10-403, *Deployment Planning and Execution*	1,2
55	AFI 10-404, *Base Support and Expeditionary Site Planning*	1,2,4,5
56	AFI 10-416, *Personnel Readiness and Mobilization*	1
57	AFI 10-503, *Base Unit Beddown Program*	2,5
58	AFPD 21-2, *Non-nuclear and Nuclear Munitions*	1
59	AFI, 21-101, *Maintenance Management of Aircraft*	1,4,5
60	AFI 21-201, *Command and Base Supplements*	1,2,4,5
61	AFI 21-201, *Management and Maintenance of Non-Nuclear Munitions*	1,2,3,4,5
62	AFI, 21-204, *Nuclear Weapons Procedures (FOUO)*	1,3,4,5
63	AFCAT, 21-209, *Ground Munitions*	1,4,5
64	AFJI, 21-211, *Emergency Munitions Support for Joint Operations*	1,2,3,4,
65	AFCSM, 21-824 Vol 1, *Combat Ammunition System-Base: D078Y/IS Software User Manual Users Manual*	4,5

66	AFCSM, 21-824 Vol 2, *Combat Ammunitions System-Base: Users Manual*	4,5
67	AFMAN, 23-110 Vol 2, *Standard Base Supply Customer's Procedures*	4
68	AFI, 23-111, *Management of Government Property in Possession of the Air Force*	4
69	AFJMAN, 23-215, *Reporting of Item and Packaging Discrepancies*	3,4
70	AFMAN, 23-220, *Reports of Survey for AF Property*	4
71	AFPD, 24-2, *Preparation and Movement of US Air Force Property*	2,3,4
72	AFI, 24-201, *Cargo Movement*	3,4
73	AFI, 24-202, *Preservation and Packaging*	3,5
74	AFJMAN, 24-204, *Preparing Hazardous Materiel for Military Air Shipment*	3,5
75	AFI, 24-206, *Packaging of Materiel*	3,5
76	AFJI, 24-210, *Packaging of Hazardous Materiel*	3,5
77	AFPD 25-1, War Reserve Materiel	1,4,
78	AF War and Mobilization Plan (WMP), *Volume 1, Annex E (Logistics)*	1,4
79	AF War and Mobilization Plan (WMP), *Volume 3, Part 2*	1,4
80	AFI, 25-101, *War Reserve Materiel (WRM) Program Guidance and Procedures*	1,4
81	AFI, 25-201, *Support Agreement Procedures*	1,5
82	AFI, 31-101, *The Air Force Physical Security Program*	2,5
83	AFH, 31-223, *The Air Force Resource Protection Program*	4,5
84	AFI, 31-401, *Information Security Management Program*	5
85	AFI, 32-1065, *Grounding Systems*	2,5
86	AFH, 32-1084, *Facility Requirements*	2,5
87	AFI, 32-2001, *Fire Protection Operations and Fire prevention Program*	5
88	AFCSM, 33-824 Vol 1, *Combat Ammunition System- Base: D078Y/IS Software Center Operator Manual*	4
89	AFI, 36-2217, *Munitions Requirements for Aircrew Training*	4,5
90	AFI, 34-371, *Air Force Competitive Shooting Program*	4,5
91	AFCAT, 36-2223, *USAF Formal Schools*	5
92	AFOSH STD, 48-137, *Respiratory Protection Program*	5
93	AFR, 75-18, *Reporting of Transportation Discrepancies in Shipments*	3,4,5
94	AFOSH STD, 91-32, *Emergency Showers and Eyewash Units*	5
95	AFOSH STD, 91-43, *Flammable and Combustible Liquids*	5
96	AFOSH STD, 91-46, *Materials Handling and Storage Equipment*	5
97	AFOSH STD, 91-56, *Fire Protection and Prevention*	5

98	AFMAN, 91-201, *Explosives Safety Standards*	1,3,5
99	AFI, 91-202, *The US Air Force Mishap Prevention Program*	1,5
100	AFI, 91-204, *Safety Investigations and Reports*	5
101	AFI, 91-205, *Non-nuclear Munitions Safety Board*	5
102	AFI, 91-213, *Operational Risk Management Program*	5
103	AFI, 91-301, *AF Occupational and Environmental Safety, Fire Prevention and Health (AFOSH) Program*	5
104	Ogden ALC WM Operating Instruction 21-201, *Inventory and Inspection Procedures for the Afloat Prepositioned Fleet Program*	2,3,4,5
105	T.O. 00-5-1, *AF Technical Order System*	1
106	T.O. 00-5-2, *Technical Order Distribution Sy*stem	5
107	T.O. 00-5-15, *AF Time Compliance Technical Order System*	1,5
108	T.O. 00-20-1, *Preventive Maintenance Program general Policy Requirements and Procedures*	1,5
109	T. O. 00-20-2, *Maintenance Data Documentation*	5
110	T.O. 00-20-3, *Maintenance Processing of Repairable Property and Repair Cycle Asset Control System*	5
111	T.O. 00-20-5, *Aerospace Vehicle Inspection and Documentation*	5
112	T.O. 00-20-7, *Inspection System, Documentation and Status Reporting for Support and Training Equipment*	4,5
113	T.O. 00-20-9, *Forecasting Replacement Requirements for Selected Calendar and Hourly Time Change Items*	4,5
114	T.O. 00-20K-1, *Inspection and Control of USAF Shelf-Life Equipment*	5
115	T.O. 00-35D-54, *USAF Material Deficiency Reporting and Investigating System*	5
116	T.O. 11-1-38, *Positioning and Tie-Down Procedures Non-nuclear Munitions*	3,5
117	T.O. 11A-1-06, *Work Unit Code Manual -- Airmunitions*	5
118	T.O. 11A-1-1, *Conventional Ammunition Restricted or Suspended*	5
119	T.O. 11A-1-10, *General Instruction -- Munitions Serviceability Procedures*	1,5
120	T.O. 11A-1-33, *Handling and Maintenance of Explosives Loaded Aircraft*	5
121	T.O. 11A-1-42, *General Instructions for Disposal of Conventional Munitions*	1,4,5
122	T.O. 11A-1-46, *Fire Fighting Guidance, Transportation, and Storage Management Data*	1,3,5
123	T.O. 11A-1-47, *Explosives Hazard Classification Procedures*	1,5
125	T.O. 11A-1-60, *General Instruction - Inspection of Reusable Munitions Containers and Scrap Material Generated From Items Exposed To, or Containing Explosives*	5

126	T.O. 11A-1-61-1, *Storage and Outloading Instruction -- Conventional Ammunition (Truck Loading Drawings*	3,4,5
127	T.O. 11A-1-61-2, *Storage and Outloading Instruction -- Conventional Ammunition (Carloading Drawings)*	2,3,4,5
128	T.O. 11A-1-61-3, *Storage And Outloading Instruction -- Conventional Ammunition (Trailer-On-Flatcar Carloading, Truckloading and Storage Drawings)*	2,3,4,5
129	T.O. 11A-1-61-4, *Storage and Outloading Instructions Conventional Ammunition (Storage Drawing for Igloos, Stradley and Standard Type Magazines and Misc. Palletizing Drawings*	2,3,4,5
130	T.O. 11A-1-61-5, *Storage And Outloading Instruction -- Conventional Ammunition (Military Van Containers Drawings)*	3,5
131	T.O. 11A-1-63, *Munitions Assembly Procedures - Inspection and Assembly Non-nuclear Munitions*	1,3,4,5
132	T.O. 11A-1-65, *Munitions 463L Palletization for Air Transport*	3,5
133	T.O. 11A-1-66, *General Instruction - Demolitions*	1,5
134	T.O. 11A-1-67, *Ammunition Restraint Systems for Commercial and Military Intermodel Containers (Assembly, Installation, Removal And Operation)(Tm 9-1300-276) (Sg 830-Aa-Gtp-010/Ammo)*	3,5
135	T.O. 11G14-4-11, *Assembly and Inspection with IPB - Field Level Maintenance Accelerator Monitoring Assembly (AMA)*	5
136	T.O. 21M-1-101, *Reliability Asset Monitoring System*	5
137	T.O. 35-1-3, *Corrosion Prevention, Painting and Marking of USAF Support Equipment (SE)*	5
138	T.O. 35-1-24, *Air Force Economic Repair/Replacement Criteria for Selected San Antonio Air Logistics Center (ALC) Managed Support Equipment (S)*	5
139	T.O. 36-1-121, *Standardization of Lunettes and Pintles (Towing Attachments)*	3,5

Appendix E

Appendix E: Interview Questionnaire

Part I:

The following questions reference your experiences in supporting munitions movement and resupply during Operation Enduring Freedom (OEF).

1. What was your duty assignment during this period?

2. While assigned in this position, what were your responsibilities pertaining to munitions movement and resupply (defined here as acquiring, sourcing, shipping, receiving, and/or integrating munitions items) during OEF?

3. Please briefly discuss munitions movement and resupply taskings that you received in support of OEF, and your actions in response to these taskings?

4. What JCS guidance (doctrine, instruction, plans, etc.) did you use in support of your actions in number 3 above? (for example JCS Pub 4.0)

5. What Air Force level guidance (doctrine, instruction, etc.) did you use in support of your actions in number 3 above? (for example AFI 21-201, or AFDD 2-4 “Combat Support”)

6. What guidance developed by your organization (local CONOPS, instruction supplements, policy documents, etc.) did you use in support of your actions in number 3 above?

7. For each of the following actions in support of OEF did you feel there was sufficient guidance available for standardized execution of the action to be taken? Why or Why not?

a. Identifying/Sourcing/Allocating

b. Shipment

c. Accountability

d. Retrograde

e. Acquisition of shortage items

8. Were there any additional actions, not mentioned in number 7 above, relating to munitions movement and resupply during OEF, that were not executed as effectively or efficiently as they might have been for lack of adequate guidance?

9. Were their any actions relating to munitions movement and resupply during OEF that were not executed as effectively or efficiently as the may might have been because the available guidance was **overly restrictive**?

10. What changes to current guidance would you recommend in response to any of the actions you took in support of OEF?

Part II:

The following questions concern munitions movement and resupply in general, emphasizing changes driven by the Air Force's implementation of the Expeditionary Air and Space Force (EAF) concept.

11. How has the movement to an EAF concept affected your current munitions movement and resupply responsibilities?

12. With regard to your response to question number eleven above, what changes to available guidance have you observed (if any) in response to EAF driven changes?

13. What changes would **you** recommend be made to current guidance (from any source) to facilitate munitions resupply given the EAF concept?

Appendix F

Appendix F: ILMW Draft CONOPs for Worldwide Munitions Resupply To Sustain High Tempo Operations

1.0. Executive Summary

1.1. The United States Air Force must be ready to project combat power worldwide in support of national command authority directed operations. The Air Force's ability to project this power is reliant on numerous factors, including the ability to deliver munitions from storage locations worldwide to the forward-deployed unit that requires it. This concept of operations (CONOPS) describes the Air Force plan for worldwide resupply of munitions to sustain high tempo operations.

1.2. Once operations begin in a theater, the combatant commander's staff determines aircraft munitions requirements. These requirements are then given to the Air Force component (CENTAF, etc.), who taps in-theater assets or requests support through the JOPES system. JOPES requests are filled by the Air Force Ammunition Control Point (ACP), in conjunction with HQ USAF/ILMW, and transported to the theater by USTRANSCOM. Once in theater, munitions are moved to specific combat units by the combatant commander's theater distribution network.

1.3. This system is governed by Joint publications, and supports Air Force operational CONOPS using combat support doctrine. It is a flexible and responsive system, proven in recent worldwide contingencies, ensuring the right bomb, in the right configuration, at the right place, and at the right time for the warfighter.

2.0. **Introduction**

2.1. The United States Air Force may be called upon to fulfill global taskings for sustained periods of time. Success at these taskings relies upon the ability of the logistics infrastructure to respond with flexible, survivable, sustainable, and reliable combat support. In the past, the Air Force could focus on a few known adversaries and rely on large, forward-deployed forces and supplies. Today, however, the Air Force has shifted to a smaller, more flexible expeditionary force whose combat units and supplies must be able to operate and sustain across great distances in unprepared locations.

2.2. Combat support covers a wide range of vital activities, including maintenance, supply, transportation, contracting, and so forth. A key logistical concern for combat operations is the supply of munitions to the forward units that need them for an air campaign. This paper focuses on the Air Force's concept for supplying munitions to a combatant commander to support any contingency. It supports Air Force operational concepts of operations using logistics doctrine, and is consistent with joint guidance.

3.0. **Background**

3.1. Current Air Force operational concepts of operation call for Air Force assets to be ready to support national command authority taskings as quickly as possible from CONUS bases or forward deployed sites[1]. Specifically, Air Force units must be able to:

- Employ directly from home stations (CONUS or OCONUS) with little or no warning
- Rapidly deploy to supplement in-theater forces
- Operate with a reduced footprint to minimize basing and force protection requirements
- Operate with reduced resupply needs to minimize strategic lift requirements
- Be able to operate aircraft in a variety of environments, including contaminated areas
- Utilize an infrastructure mix of pre-positioned and deployable assets

These CONOPS require a force that can deploy quickly, then sustain operations for as long as, and from wherever, necessary. Successful combat air operations of this magnitude and flexibility, however, require superior, agile logistical support.

3.2. Air Force combat support doctrine states the underlying principles of combat support: responsiveness, survivability, sustainability, time-definite resupply, and information integration[2]. Of particular import to this munitions resupply CONOPS are the following key doctrinal requirements:

- Early planning and integration of strategic lift
- Reliable communication and information systems
- Effective asset visibility
- An efficient and effective in-theater distribution system

3.3. This document serves to fulfill Air Force logistics doctrine in support of operational CONOPS. Specifically, it details the process of resupplying munitions to forward areas to sustain high tempo combat operations. This process ensures the right bomb, in the right configuration, at the right place, and at the right time for the warfighter**.**

[1] Taken from AF CONOPS 2020, Global Strike Task Force, and Global Response Task Force white papers

4.0. **Munitions Resupply Concept**

4.1. During peacetime, combatant command planners use the deliberate planning process to develop assessments and operations plans (OPLANs) for various possible contingencies[3]. These plans contain logistics requirements compiled by the combatant commander's service components, who are responsible for logistics planning and support for their in-theater assets per JP 4-0. These logistics estimates, including munitions requirements, are disseminated through OPLAN Annex D to the appropriate USAF organizations per AFI 21-201. Filed OPLANs will ensure that additional munitions resupply efforts are started as quickly as possible after the plans are enacted.

4.2. When directed by the national command authority to conduct military operations, the combatant commanders refine existing strategies and plans for the area of operations or develop new campaign plans as appropriate[4]. The Joint Forces Air Component Commander (JFACC) staff uses the combatant commander's campaign plan to construct and run the air campaign. During this continuous planning cycle the JFACC staff will forecast the type and amount of munitions that are required. The Air Force portion of these requirements will then filter through the combatant commander's Air Force component A-3 (operations) to the A-4 (logistics). A-4 is responsible to the combatant commander for supplying munitions to the his/her Air Force warfighters, as outlined in JP 4-0. The following concept of operations applies to munitions resupply to forward areas to sustain high-volume precision strikes (see figure 4).

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[2] AFDD 2-4, Combat Support, 22 Nov 99
[3] JP 3.0, Doctrine for Joint Operations, 10 Sep 01
[4] JP 3.0, Doctrine for Joint Operations, 10 Sep 01

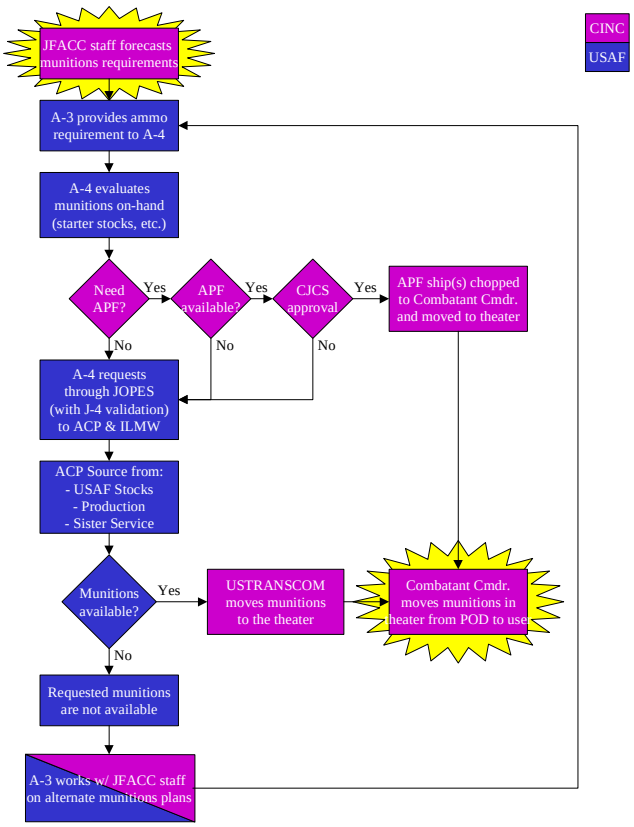

Figure 4 Munitions Resupply Process

4.3. The A-4 begins the process of sourcing the JFACC's munitions requirements. Initial munitions for the contingency usually come from starter stocks, which are pre-positioned in theater and are under the combatant commander's control[5]. If required, the combatant commander may direct an inter-service transfer of in-theater munitions as described in JP 4-0.

4.3.1. In addition to starter stocks, the A-4, through the combatant commander, can request deployment of one or more afloat pre-positioning fleet (APF) leased ships. These three ships are stationed in various strategic locations, and are loaded with approximately 1100

standard 20-foot ISO containers worth of munitions. A fourth ship will be added in late 2002, which will add to the fleet's flexibility. The JSCP apportions the APF ships as forces to CINCs, however during execution APF ships and cargo will be committed according to CJCS-established priorities[6]. If the combatant commander desires an available APF ship, he/she must request it from the CJCS. Once the ship is approved, it is chopped to the CINC and moves to the best in-theater port where USTRANSCOM is responsible for offloading operations. Whenever an APF ship is used for a contingency, an Air Force port handling team and a port management team will be present to account for and direct the flow of offloaded munitions. These very limited assets are deployed to the theater but remain under operational control of the Chief of Staff of the Air Force, so that they may be moved to subsequent war reserve material (WRM) taskings as soon as APF offloading is complete.

4.3.2. If the A-4 determines that munitions from in-theater and the APF are insufficient, A-4 will source additional requirements throughout the campaign using JOPES procedures per AFI 25-101. JOPES requests will be validated by the J-4 and forwarded to the Ammunition Control Point (ACP) at OO-ALC/WM.

4.4. ACP controls, optimizes and allocates Air Force munitions stockpiles, and is responsible for resupply of combat units per AFI 21-201. During contingencies, HQ USAF/ILMW is tasked by the same instruction to guide the ACP's decisions. Under this concept of operations, therefore, these two organizations will work closely together to determine the best source from which to fill the munitions request. There are several sourcing options:

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[5] DoDD 3110.6, War Reserve Material Policy
[6] CJCSI 4310.01, Logistic Planning Guidance for Pre-Positioning Ships

- Swing stocks (other than APF): WRM in the form of Standard air munitions packages (STAMP), which are prepackaged UTCs of CONUS-based munitions ready for airlift, or bomber flyaway (BFA), which are initial bomb loads carried to theater targets directly from CONUS bomber bases.
- Worldwide USAF munitions stockpiles: Munitions stored in various worldwide Air Force locations.
- New production assets: Munitions shipped directly from a new or existing production line.
- Other U.S. military service assets: Munitions from other service stockpiles outside the contingency theater usually borrowed with an agreed repayment schedule.

4.5. Once a JOPES munitions request has been matched to available assets, ACP works with USTRANSCOM to move them into theater according to the JOPES delivery date and location from point of origin to the requested in-theater point of debarkation (POD). The POD is the airfield or port where the munitions initially enter the combatant commander's theater. The actual delivery method will vary depending on the initial location of the munitions, available strategic lift assets, and combatant commander's priorities. While in transit to the POD, USTRANSCOM is responsible for in-transit visibility (ITV) of munitions per JP 4-01.7 to ensure the combatant commander and CJCS have constant status of resupply efforts (see figure 2).

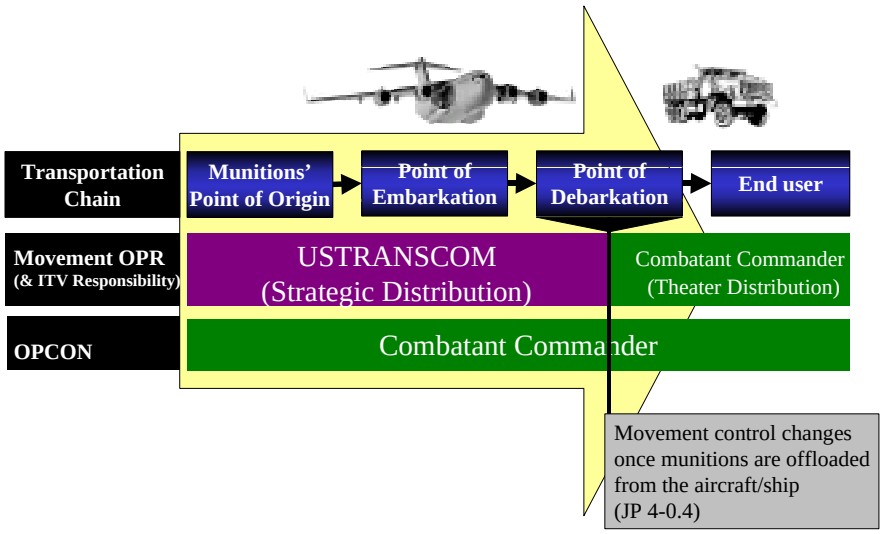

Figure 5 The Transportation System

4.6. Once sourced and put in motion forward, munitions are under the operational control (OPCON) of the combatant commander. Once delivered in theater at the POD, it is additionally the combatant commander's responsibility to have an established theater distribution network to safely and adequately move munitions via road, rail, or intra-theater airlift. Port handling operations are the responsibility of USTRANSCOM. Air Mobility Command is the single aerial port manager and Military Traffic Management Command is the single seaport manager. Air Force components are responsible for maintaining adequate facilities, personnel, and equipment to receive, store, and use munitions at Air Force forward and collocated operating bases, per AFI 21-201.

4.7. If the combatant commander's requested munitions are not available worldwide, ACP will notify the A-4 who must work with the A-3/JFACC staff to use an alternate munitions or targeting strategy.

List of Abbreviations

ACC	Air Combat Command
ACP	Ammunitions Control Point
ACS	Agile Combat Support
AEF	Aerospace Expeditionary Force
AF	Air Force
AFB	Air Force Base
AFCOMAC	Air Force Combat Ammunitions Center
AFDD	Air Force Doctrine Document
AFPD	Air Force Policy Document
AFI	Air Force Instruction
AOR	Area of Responsibility
CONPLAN	Concept Plan
CADS	Containerized Ammunition Distribution System
CAF	Combat Air Forces
CAS	Combat Ammunition System
CBU	Cluster Bomb Unit
CENTCOM	Central Command
CFR	Code of Federal Regulation
CINC	Commander in Chief
CJCS	Chairman Joint Chiefs of Staff
CJCSI	Chairman Joint Chiefs of Staff Instruction
CJCSM	Chairman Joint Chiefs of Staff Manual
CONUS	Continental United States
CSAF	Chief of Staff of the Air Force
DoD	Department of Defense
EAF	Expeditionary Air Force
EUCOM	European Command
FOL	Forward Operating Location
GBU	Guided Bomb Unit
HAF	Headquarters Air Force
JCS	Joint Chiefs of Staff
JDAM	Joint Direct Attack Munitions
JP	Joint Publication
JSCP	Joint Strategic Capabilities Plan
JV	Joint Vision
MAJCOM	Major Command
MEP	Munitions Employment Plan
OEF	Operation Enduring Freedom

OPLAN	Operational Plan
PACAF	Pacific Air Forces
PREPO	Preposition
RF	Radio Frequency
SECDEF	Secretary of Defense
STAMP	Standard Air Munitions Package
STRAPP	Standard Tanks, Racks, Adapters, and Pylon Packages
TACP	Tactical Ammunitions Control Point
T.O.	Technical Order
TRANSCOM	Transportation Command
US	United States
USAF	United States Air Force
USAFE	United States Air Forces Europe
USTRANSCOM	United States Transportation Command

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